

NAME KEY

PERIOD _____ DATE _____

Day 4

unit 12
Day 4

DOMAIN AND RANGE

Find the domain and range of each function.

1) $f(x) = \sqrt{8+x}$ ✓

2) $g(x) = \sqrt{3x+2}$ ✓

3) $f(x) = \sqrt{16-x^2}$ ✓

4) $g(x) = \sqrt{x^2-25}$ ✓

5) $f(x) = \sqrt[3]{x-1}$ ✓

6) $g(x) = -\sqrt[3]{1-x^2}$ ✓

7) $f(x) = \frac{10}{3-x}$ ✓

8) $g(x) = \frac{2}{x-1}$ ✓

9) $f(x) = \frac{1}{x^2-4}$ ✓

10) $g(x) = \frac{5}{9-x^2}$ ✓

11) $f(x) = |3x-4|+2$ ✓

12) $g(x) = -|2x-7|+5$ ✓

13) $f(x) = -\sqrt{x^2-4x-5}$ ✓

14) $g(x) = -\sqrt{x^2+7x+10}$

15) $f(x) = \frac{2}{x^2-3x+2}$

16) $g(x) = \frac{-4}{x^2+5x+4}$ ✓

Day 4

Domain + Range Worksheet

Unit 12

① $f(x) = \sqrt{8+x}$

$$8+x \geq 0$$

$$x \geq -8$$

D: $[-8, \infty)$

X: $[-8, \infty)$

$8+x: [0, \infty)$

$\sqrt{8+x}: [0, \infty)$

R: $[0, \infty)$

② $g(x) = \sqrt{3x+2}$

$$3x+2 \geq 0$$

$$x \geq -\frac{2}{3}$$

D: $[-\frac{2}{3}, \infty)$

X: $[-\frac{2}{3}, \infty)$

$3x+2: [0, \infty)$

$\sqrt{3x+2}: [0, \infty)$

R: $[0, \infty)$

③ $f(x) = \sqrt{16-x^2}$

$$16-x^2 \geq 0$$

$$(4-x)(4+x) \geq 0$$

$\begin{matrix} (4-x) & (4+x) & (4-x) \\ \leftarrow & \text{---} & \rightarrow \\ -4 & \text{---} & 4 \end{matrix}$

D: $[-4, 4]$

X: $[-4, 4]$

$x^2: [0, 16]$

$-x^2: [-16, 0]$

$16-x^2: [0, 16]$

$\sqrt{16-x^2}: [0, 4]$

R: $[0, 4]$

④ $g(x) = \sqrt{x^2-25}$

$$x^2-25 \geq 0$$

$$(x-5)(x+5) \geq 0$$

$\begin{matrix} (x-5) & (x+5) & (x-5) \\ \leftarrow & \text{---} & \rightarrow \\ -5 & \text{---} & 5 \end{matrix}$

D: $(-\infty, -5] \cup [5, \infty)$

X: $(-\infty, -5] \cup [5, \infty)$

$x^2: [25, \infty)$

$x^2-25: [0, \infty)$

$\sqrt{x^2-25}: [0, \infty)$

R: $[0, \infty)$

⑤ $f(x) = \sqrt[3]{x-1}$

D: $(-\infty, \infty)$

X: $(-\infty, \infty)$

$x-1: (-\infty, \infty)$

$\sqrt[3]{x-1}: (-\infty, \infty)$

R: $(-\infty, \infty)$

⑥ $g(x) = -\sqrt[3]{1-x^2}$

D: $(-\infty, \infty)$

X: $(-\infty, \infty)$

$x^2: [0, \infty)$

$-x^2: (-\infty, 0]$

$1-x^2: (-\infty, 1]$

$\sqrt[3]{1-x^2}: (-\infty, 1]$

$- \sqrt[3]{1-x^2}: [-1, \infty)$

R: $[-1, \infty)$

⑦ $f(x) = \frac{10}{3-x}$

$$3-x \neq 0$$

$$-x \neq -3$$

$$x \neq 3$$

D: $(-\infty, 3) \cup (3, \infty)$

X: $(-\infty, 3) \cup (3, \infty)$

$-x: (-\infty, -3) \cup (-3, \infty)$

$3-x: (-\infty, 0) \cup (0, \infty)$

$\frac{1}{3-x}: (-\infty, 0) \cup (0, \infty)$

$\frac{10}{3-x}: (-\infty, 0) \cup (0, \infty)$

R: $(-\infty, 0) \cup (0, \infty)$

⑧ $g(x) = \frac{2}{x-1}$

$$x-1 \neq 0$$

$$x \neq 1$$

D: $(-\infty, 1) \cup (1, \infty)$

X: $(-\infty, 1) \cup (1, \infty)$

$x-1: (-\infty, 0) \cup (0, \infty)$

$\frac{1}{x-1}: (-\infty, 0) \cup (0, \infty)$

$\frac{2}{x-1}: (-\infty, 0) \cup (0, \infty)$

R: $(-\infty, 0) \cup (0, \infty)$

⑨ $f(x) = \frac{1}{x^2-4}$

$$x^2-4 \neq 0$$

$$(x-2)(x+2) \neq 0$$

$$x \neq 2 \quad x \neq -2$$

D: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

X: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

$x^2: [0, 4) \cup (4, \infty)$

$x^2-4: [-4, 0) \cup (0, \infty)$

$\frac{1}{x^2-4}: (-\infty, -\frac{1}{4}] \cup (0, \infty)$

R: $(-\infty, -\frac{1}{4}] \cup (0, \infty)$

⑩ $g(x) = \frac{5}{9-x^2}$

$$9-x^2 \neq 0$$

$$(3-x)(3+x) \neq 0$$

$$x \neq 3 \quad x \neq -3$$

D: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

X: $(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

$x^2: [0, 9) \cup (9, \infty)$

$-x^2: (-\infty, -9) \cup (-9, 0]$

$9-x^2: (-\infty, 0) \cup (0, 9]$

$\frac{1}{9-x^2}: (-\infty, 0) \cup [\frac{1}{9}, \infty)$

$\frac{5}{9-x^2}: (-\infty, 0) \cup [\frac{5}{9}, \infty)$

Day 4 D + R Workshop Continued Unit 12

⑪ $f(x) = |3x-4|+2$ (12) $g(x) = -|2x-7|+5$

No restrictions on x

D: $(-\infty, \infty)$

X: $(-\infty, \infty)$

$3x$: $(-\infty, \infty)$

$3x-4$: $(-\infty, \infty)$

$|3x-4|$: $[0, \infty)$

$|3x-4|+2$: $[2, \infty)$

R: $[2, \infty)$

D: $(-\infty, \infty)$

X: $(-\infty, \infty)$

$2x$: $(-\infty, \infty)$

$2x-7$: $(-\infty, \infty)$

$|2x-7|$: $[0, \infty)$

$-|2x-7|$: $(-\infty, 0]$

$-|2x-7|+5$: $(-\infty, 5]$

R: $(-\infty, 5]$

⑬ $f(x) = -\sqrt{x^2-4x-5}$ $x-2$: $(-\infty, 3] \cup [5, \infty)$

$x^2-4x-5 \geq 0$

$(x-5)(x+1) \geq 0$

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$(x-2)^2$: $[9, \infty)$

$(x-2)^2-9$: $[0, \infty)$

$\sqrt{(x-2)^2-9}$: $[0, \infty)$

$-\sqrt{(x-2)^2-9}$: $(-\infty, 0]$

R: $(-\infty, 0]$

⑭ $g(x) = -\sqrt{x^2+7x+10}$

$x^2+7x+10 \geq 0$

$(x+2)(x+5) \geq 0$

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$(x+2)(x+5) \geq 0$

$x^2-3x+2 \neq 0$

$(x-2)(x-1) \neq 0$

$x \neq 2$ $x \neq 1$

D: $(-\infty, 1) \cup (1, 2) \cup (2, \infty)$

$f(x) = \frac{2}{(x^2-3x+\frac{9}{4})+2-\frac{9}{4}}$

$f(x) = \frac{2}{(x-\frac{3}{2})^2-\frac{1}{4}}$

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⑮ $g(x) = \frac{-4}{x^2+5x+4}$

$x^2+5x+4 \neq 0$

$(x+4)(x+1) \neq 0$

$x \neq -4$ $x \neq -1$

D: $(-\infty, -4) \cup (-4, -1) \cup (-1, \infty)$

$g(x) = \frac{-4}{(x^2+5x+\frac{25}{4})+4-\frac{25}{4}}$

$g(x) = \frac{-4}{(x+\frac{5}{2})^2-\frac{9}{4}}$

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R: $(-\infty, 0) \cup [\frac{16}{9}, \infty)$

$\frac{4}{(x+\frac{5}{2})^2-\frac{9}{4}} : (-\infty, -\frac{16}{9}) \cup (0, \infty)$

$-\frac{4}{(x+\frac{5}{2})^2-\frac{9}{4}} : (-\infty, 0) \cup [\frac{16}{9}, \infty)$